INSTRUMENTATION & AUTOMATION ENGINEERING TECHNOLOGY

BACHELOR OF TECHNOLOGY (129 CREDIT HOURS)

The Instrumentation & Automation Engineering Technology program prepares students to meet the technical demands of our increasingly automated society. Program graduates will gain expertise in automation and process control technologies, PLC programming, process troubleshooting, industrial IT networks, measurement instrumentation, discrete and analog control systems, microcontrollers, robotics, and electrical power distribution.

Program graduates will design, research, evaluate, test, repair, and maintain many types of electrical, mechanical, and automation systems that span most industrial and manufacturing disciplines. Program graduates can find employment opportunities in the energy, petroleum, biomedical, chemical, cyber, electrical, industrial, and manufacturing disciplines, working for some of the world's largest corporations.

The Bureau of Labor Statistics predicts the job market for instrumentation technologists will continue to grow. The International Society of Automation notes positions in automation and control offer above-average pay and benefits because of the level of skill and responsibility involved. Bachelor of Technology graduates have excellent opportunities for advancement into management positions due to their broad understanding of production processes, business acumen, and problem-solving skills as companies continue to install and upgrade high-tech production systems. Companies are adding sophisticated instrumentation and control systems to existing oil and gas production, food and chemical processing, and power generation facilities. Program graduates play a crucial part in this process, which extends the life of these facilities and enables them to meet stringent environmental requirements.

OSUIT's experienced instructors work closely with industry leaders to incorporate the latest business practices and emerging technologies into the program. Faculty provide students with one-on-one instruction, theory, hands-on technical skills, and general education classes that position graduates to quickly move to the top of their field.

Program Entry Requirements

1. Hold an Associate in Applied Science degree or higher that meets one of the following criteria:
    a. Graduates with an AAS in Engineering Technologies from OSUIT have the option of articulating directly into the BT program. A specific sequence of courses is required to ensure a seamless transition from the AAS to BT degree; or
    b. Graduates from other AAS degrees may be required to take bridge courses prior to entering the BT program.
2. Complete the OSUIT admission process (i.e., application for general admission and admission to the BT program, housing, etc.).

This program of study requires special program fees beyond OSUIT's current tuition and mandatory fees.

Students must complete all technical courses with a grade of C or better and maintain a 2.50 overall (retention/graduation) GPA.

For more detailed information regarding the BT in Instrumentation & Automation Engineering Technology – including a required tool list – please contact a program advisor at 918-293-5150 or visit osuit.edu/instrumentation.

PROGRAM REQUIREMENTS: 84 CREDIT HOURS

INSTRUMENTATION & AUTOMATION (78 CREDIT HOURS)

ETD	1012	Safety Applications
ETD	2411	Employment Exploration
ETDE	1003	Introduction to Instrumentation Technology
ETDE	1283	AC/DC Circuits I [C]
ETDE	1293	AC/DC Circuits II [C],[P]
ETDE	1343	Motors & Controls [C],[P]
ETDE	1363	Electronic Devices & Standards [P]
ETDE	1373	Digital Systems & Microcontrollers [P]
ETDE	2113	Introduction to PLCs [P]
ETDE	2133	Instrumentation [P]
ETDE	2223	Electrical Power Distribution [C],[P]
ETDE	2253	Hydraulics & Pneumatics [P]
ETDE	2273	Electronic Control Devices [P]
ETDE	3143	PLC Applications [P]
ETDE	3213	Project Management & Engineering Economics
ETDE	3223	Industrial Networks [C],[P]
ETDE	3233	Liquid & Gas Flow Measurement [P]
ETDE	3313	Heat Transfer & Fluid Mechanics [P]
ETDE	3513	Programming for Instrumentation [P]
ETDE	4112	Electrical/Electronics Instrumentation Internship [P] (12 cred hours)
ETDE	4133	Process Measurement & Control [P]
ETDE	4313	Process Management [P]
ETDE	4813	Instrumentation Capstone [P]
ETDG	1143	Introduction to Design/Drafting [C]

APPROVED TECHNICAL ELECTIVES (6 CREDIT HOURS)

Selected from technical courses not utilized to meet other program requirements, as approved by the program advisor.

Lower-Division Technical Elective (3 credit hours)
Upper-Division Technical Elective (3 credit hours)

GENERAL EDUCATION REQUIREMENTS: 45 CREDIT HOURS

AMERICAN HISTORY & GOVERNMENT (6 CREDIT HOURS)

HIST	1483	US History to 1865 *or*
HIST	1493	US History since 1865
POLS	1113	US Government

COMMUNICATIONS (6 CREDIT HOURS)

Select from courses listed below or others as approved by program advisor.

ENGL	1113	Freshman Composition I *or*
ENGL	1033	Technical Writing I
SPCH	1113	Introduction to Speech Communications *or*
SPCH	2313	Small Group Communications

COMPUTER LITERACY (3 CREDIT HOURS)

CS	1013	Computer Literacy & Applications

HUMANITIES (6 CREDIT HOURS)

Select from courses designated with an "H" as approved by program advisor, including, but not limited to, course(s) listed below.

PHIL	1213	Ethics (H, S)

Humanities Elective (3 credit hours)

MATHEMATICS (13 CREDIT HOURS)

MATH	1513	Pre-Calculus (A)
MATH	1613	Trigonometry [P] (A)
MATH	2144	Calculus I [P] (A)
MATH	2513	Calculus II [P] (A)

SCIENCE (8 CREDIT HOURS)

CHEM	1314	General Chemistry I [C] (L, N)
PHYS	1114	General Physics I [P] (L, N)

SOCIAL & BEHAVIORAL SCIENCES (3 CREDIT HOURS)

Select from courses designated with an "S" as approved by program advisor, including, but not limited to, course(s) listed below.

PSYC	1113	Introductory Psychology (S)

ENGINEERING & CONSTRUCTION TECHNOLOGIES

[C],[P]: Course has [C]orequisite and/or [P]rerequisite requirement(s). See Course Description for details.

BT in Instrumentation & Automation Engineering Technology (IAET) Program Educational Objectives:

The IAET program focuses on the application of electronics and computer technology to instrumentation, industrial automation, and process control systems and prepares graduates:

- who have a sound knowledge base and the skill sets needed to develop and expand professional careers in fields related to instrumentation technologies, process control, and industrial processes automation;
- who are well-rounded individuals with strong personal skills, competent in all forms of communication, able to work in team environments, and who possess a strong sense of professionalism;
- who will meet industry expectations in managing ethical, societal, and environmental issues in the practice of instrumentation engineering technology; and
- capable of career advancement and professional development who understand the importance of life-long learning.

IAET Student Learning Outcomes:

IAET graduates will have the ability to:

- apply the concepts of chemistry, physics, and electricity/electronics to measurement and control systems;
- design and implement systems utilizing analog and digital control devices;
- apply concepts of automatic control, including measurement, feedback, and feed-forward regulation for the operation of continuous and discrete systems;
- solve technical problems and be proficient in the analysis, design, testing, and implementation of instrumentation and control systems utilizing appropriate software and hardware tools and devices;
- conduct information searching and processing, and develop the ability for life-long learning;
- effectively communicate technical information and details verbally and in writing and be able to work in a team;
- apply the concepts of mechanics, fluid mechanics, and heat transfer to the design of process control systems;
- understand and utilize programmable logic controllers (PLC), distributed control systems (DCS), and supervisory control systems for control of manufacturing and processing systems;
- utilize modern and effective management skills for performing investigation, analysis, and synthesis in the implementation of automatic control systems;
- understand and uphold professional, ethical, and societal responsibilities; and
- conduct, analyze, and interpret experimental results to improve processes.